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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/554,136

05/12/2006

Hiroshi Kawazoe

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EXAMINER

HSIEH, HSIN YI

ART UNIT

PAPER NUMBER

2811

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DELIVERY MODE

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/554,136	Applicant(s) KAWAZOE ET AL.	
	Examiner Hsin-Yi (Steven) Hsieh	Art Unit 2811	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10/21/2005, 05/12/2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 October 2005 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>20060512, 20080124, 20080219, 20080219, 20080814, 20080911</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

2. The information disclosure statements (IDS) submitted on 05/12/2006, 02/19/2008, 02/19/2008, 08/14/2008, and 09/11/2008 are in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statements are being considered by the examiner.
3. The information disclosure statement filed 01/24/2008 fails to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each cited foreign patent document; each non-patent literature publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. It has been placed in the application file, but the information referred to therein has not been considered.
4. The listing of references in the specification is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609.04(a) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless the references have been cited by the examiner on form PTO-892, they have not been considered.

Drawings

5. Figure 2 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.
6. The drawings are objected to because foreign characters are shown in all figures, and Figs. 1-5 and 9-11 have the shades that make the lines and outlines unclear. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and

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informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

7. Claims 1-10 are objected to because of the following informalities:
 - a. Claim 1 recites “these electrodes” in the 5th line of the claim, which lacks the antecedent basis. It is recommended replacing “these electrodes” with “the n-electrode and the p-electrode”.
 - b. Claim 4 recites “the n-type electrode” in the third line of the claim, which lacks the antecedent basis. It is recommended to replace the “the n-type electrode” with “the n-electrode”.
 - c. Claim 5 recites “the p-type electrode” in the third line of the claim, which lacks the antecedent basis. It is recommended to replace the “the p-type electrode” with “the p-electrode”.
 - d. Claim 6 recites “the n-type electrode” in the third line of the claim and “the p-type electrode” in the fifth line of the claim, which lack the antecedent basis. It is recommended to replace the “the n-type electrode” with “the n-electrode”, and “the p-type electrode” with “the p-electrode”.
 - e. Claim 2-3 and 7-10 are rejected because they depend on the rejected claim 1.
8. Claims 4-9 are objected because they refers to clam 10, which is not permissible, as a dependent claim can only refers to a preceding claim.

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A series of singular dependent claims is permissible in which a dependent claim refers to a preceding claim which, in turn, refers to another preceding claim.

A claim which depends from a dependent claim should not be separated by any claim which does not also depend from said dependent claim. It should be kept in mind that a dependent claim may refer to any preceding independent claim. In general, applicant's sequence will not be changed. See MPEP § 608.01(n).

Appropriate correction is required.

Double Patenting

9. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the “right to exclude” granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

10. Claims 1 and 2 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1, 4, and 28 of copending Application No. 10/505,051. Although the conflicting claims are not identical, they are not patentably distinct

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from each other because Claims 1 and 2 of the instant application are obvious variants of claims 1, 4, and 28 of copending Application No. 10/505,051. The limitation of "in a non-barrier junction manner" in the 5th line of claim 1 of the instant application is implied by the limitations "source electrode" and "drain electrode" in claim 1 of copending Application No. 10/505,051, as "source electrode" and "drain electrode" form ohmic contacts to the device (i.e. in a non-barrier junction manner".

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claim Rejections - 35 USC § 112

11. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

12. **Claims 1-10** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

13. Claim 1 recites "which" in the 5th line of the claim. It is unclear what this recitation refers to.

14. Claim 1 recites "contact these electrodes in a non-barrier junction manner" in the 5th line of the claims. The term "non-barrier junction" is an uncommon term and is not defined in the specification, although some examples of forming non-barrier junction are disclosed. This renders the limitation "contact these electrodes in a non-barrier junction manner" indefinite.

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15. Claim 8 recites “an ambipolar inorganic semiconductor material” in the third line of the claim. It is unclear whether this limitation is the same as or different from the limitation “an ambipolar inorganic semiconductor material” recited in the 6th line of claim 1.

16. Claim 8 recites “each other” in the 5th line of the claim. It is unclear what this recitation refers to.

17. Claim 9 recites “an ambipolar inorganic semiconductor material” in the fourth line of the claim. It is unclear whether this limitation is the same as or different from the limitation “an ambipolar inorganic semiconductor material” recited in the 6th line of claim 1.

18. Claim 2-7 and 10 are rejected because they depend on the rejected claim 1.

Claim Rejections - 35 USC § 102

19. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

20. **Claims 1-3 and 7-10** are rejected under 35 U.S.C. 102(b) as being anticipated by Mensz (US 5,422,902 A) as can be understood since claims 1-10 have been rejected under 35 U.S.C. 112.

21. Regarding **claim 1**, Mensz teaches a light-emitting diode (laser diode 10; Fig. 5, col. 6 line 28) characterized by comprising: an electron injecting electrode, that is, an n-electrode (n-type waveguide cladding layer 22; Fig. 5, col. 6 line 33); a hole injecting electrode, that is, a p-electrode (p-ZnS₂Se_{1-z} top waveguide cladding layer 30; Fig. 5, col. 6 lines 40-41); and an

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inorganic light-emitting layer (ZnSe 24, active region 26 and p-ZnSe guiding layer 28; Fig. 5, col. 6 lines 35-39) which is disposed between the n-electrode (22) and the p-electrode (30) so as to contact these electrodes (22 and 30) in a non-barrier junction manner (ohmic contacts, as 22 and 24 are both n-type, and 28 and 30 are both p-type) and which (24, 26 and 28) is formed of an ambipolar inorganic semiconductor material (ZnSe is an ambipolar inorganic semiconductor material), wherein the ambipolar inorganic semiconductor material is selected from the group consisting of (a) a group II-VI compound and (b) Zn and at least one element selected from the group consisting of S, Se and Te (i.e. ZnSe).

22. Regarding **claim 2**, Mensz also teaches a the light-emitting diode according to claim 1, characterized in that the ambipolar inorganic semiconductor material has a dopant concentration of 0.1% or less in atomic ratio ($2 \times 10^{17} \text{ cm}^{-3}$ for 24 and 30 which is less than 10^{-5} in atomic ratio; col. 6 lines 53-55).

23. Regarding **claim 3**, Mensz also teaches the light-emitting diode according to claim 1, characterized in that a thickness of the inorganic light-emitting layer (24, 26, 28) is in a range of 10 nm or more and 10 μm or less (about 1 - 2.5 μm ; col. 7 lines 1-6).

24. Regarding **claim 7**, Mensz also teaches the light-emitting diode according to any one of claims 1 to 3 and 10, characterized in that a material (the material of 22) of a portion contacting the light-emitting layer (24, 26 and 28) in at least one of the n-type electrode (22) and the p-type electrode (30) is formed by use of a material ($\text{ZnS}_x\text{Se}_{1-x}$) substantially different from the material of the light-emitting layer (ZnSe of 24 and 28)

25. Regarding **claim 8**, Mensz also teaches the light-emitting diode according to any one of claims 1 to 3 and 10, characterized in that an ambipolar inorganic semiconductor material (24,

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26, 28; ZnSe of 24 and 28 is an ambipolar inorganic semiconductor material; Fig. 5, col. 6 lines 35-39) is formed on a crystalline substrate or a glass substrate (GaAs substrate 20, which is crystalline as its lattice constant is mentioned; Fig. 5, col. 6 lines 29,13), and the n-electrode (22) and the p-electrode (30) are formed on the ambipolar inorganic semiconductor material (24, 26, 28; 22 and 30 form on the opposite sides of 24, 26, and 28) so as not to contact each other (22 not contacting 30; see Fig. 5).

26. Regarding **claim 9**, Mensz also teaches the light-emitting diode according to any one of claims 1 to 3 and 10, characterized in that the n-electrode (22) or the p-electrode (30) is formed on a crystalline substrate or a glass substrate (GaAs substrate 20, which is crystalline as its lattice constant is mentioned; Fig. 5, col. 6 lines 29,13), and an ambipolar inorganic semiconductor material (24, 26, and 28) is stacked thereon (24, 26, 28 is stacked on 20), and the p-electrode (30) or the n-electrode (22) is stacked thereon (30 and 22 are stacked on 20).

27. Regarding **claim 10**, Mensz also teaches the light-emitting diode according to claim 2, characterized in that a thickness of the inorganic light-emitting layer (24, 26, 28) is in a range of 10 nm or more and 10 μm or less (about 1 - 2.5 μm ; col. 7 lines 1-6).

Claim Rejections - 35 USC § 103

28. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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29. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

30. **Claims 4-6** are rejected under 35 U.S.C. 103(a) as being unpatentable over Mensz as applied to claims 1-3 and 10 above as can be understood since claims 1-10 have been rejected under 35 U.S.C. 112.

31. Regarding **claim 4**, Mensz also teaches the light-emitting diode according to any one of claims 1 to 3 and 10, characterized in that the n-type electrode (22) includes a layer (22) formed by use of an n-type inorganic semiconductor material (n-type $\text{ZnS}_x\text{Se}_{1-x}$; col. 6 lines 33-34) in which an n-type dopant is diffused into the ambipolar inorganic semiconductor material (this limitation is considered as the method of forming device, and the method of forming a device is not germane to the issue of patentability of the device itself. Therefore, this limitation has not been given patentable weight).

32. Regarding **claim 5**, Mensz also teaches the light-emitting diode according to any one of claims 1 to 3 and 10, characterized in that the p-type electrode (30) includes a layer (30) formed by use of a p-type inorganic semiconductor material (p-type $\text{ZnS}_z\text{Se}_{1-z}$; col. 6 lines 40-41) in which a p-type dopant is diffused into the ambipolar inorganic semiconductor material (this limitation is considered as the method of forming device, and the method of forming a device is

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not germane to the issue of patentability of the device itself. Therefore, this limitation has not been given patentable weight).

33. Regarding **claim 6**, Mensz also teaches the light-emitting diode according to any one of claims 1 to 3 and 10, characterized in that the n-type electrode (22) includes a layer (22) formed by use of an n-type inorganic semiconductor material (n-type $\text{ZnS}_x\text{Se}_{1-x}$; col. 6 lines 33-34) in which an n-type dopant is diffused into the ambipolar inorganic semiconductor material (this limitation is considered as the method of forming device, and the method of forming a device is not germane to the issue of patentability of the device itself. Therefore, this limitation has not been given patentable weight), and the p-type electrode (30) includes a layer (30) formed by use of a p-type inorganic semiconductor material (p-type $\text{ZnS}_z\text{Se}_{1-z}$; col. 6 lines 40-41) in which a p-type dopant is diffused into the ambipolar inorganic semiconductor material (this limitation is considered as the method of forming device, and the method of forming a device is not germane to the issue of patentability of the device itself. Therefore, this limitation has not been given patentable weight).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hsin-Yi (Steven) Hsieh whose telephone number is 571-270-3043. The examiner can normally be reached on Monday to Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lynne A. Gurley can be reached on 571-272-1670. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Lynne A. Gurley/
Supervisory Patent Examiner, Art Unit 2811

/H. H./
Examiner, Art Unit 2811
9/13/2008